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Health and Safety Plan

Project Name: PCBs in Caulk

Work Assignment:0-49

September 2009

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Andy Stinson 10-23-09
Andy Stinson Date
Work Assignment Leader

Jerry R. Revis 10-23-09
Jerry Revis Date
Safety Officer

Todd A Thornton 10/23/09
Todd Thornton Date
Assistant Safety Officer

Health and Safety Plan

PCBs in Caulk

Prepared for:
Internal Use – ARCADIS ORLS Staff

Prepared by:
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Our Ref.:
RN990270.0049

Date:
September 2009

Appendices

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1. INTRODUCTION

All work on this project will be carried out in compliance with ARCADIS' Health and Safety Procedures, the ARCADIS Field Health & Safety Handbook (FHSH), and the U.S. EPA's RTP Chemical Hygiene Plan (RTP Campus). Specific safety information for the project is contained in this Health and Safety Plan (HASP). All personnel working on hazardous operations or in the area of hazardous operations shall read and be familiar with this HASP before doing any work. All project personnel shall sign the certification page acknowledging that they have read, understand, and will abide by this HASP

Note: This HASP does not include any potential field work. A separate Field HASP must be completed for any field work associated with this project.

2. PROJECT INFORMATION

2.1 Project Description/Scope of Work

This project will focus research on 1) a chamber study to determine if there is a correlation between the levels of PCB in the caulk and what is found in indoor air, dust, or soil, and 2) testing mitigation measures to prevent exposure to PCBs contained in surrounding materials.

ARCADIS will develop a method (or revise an appropriate existing method) to uniformly apply a known concentration of appropriate PCBs to a substrate. This may be accomplished by dosing known concentrations of PCBs into paint and uniformly coating a substrate (aluminum or stainless steel) with the PCB-spiked paint or uniformly dosing a fibrous substrate such as paper with a known concentration of the appropriate PCBs.

In addition, ARCADIS will utilize the Markes µ-CTE Micro Chamber/Thermal Extractor to measure PCB off-gassing from selected caulk products and standards. The system is comprised of six micro-chambers, which allow surface or bulk emissions to be tested from up to six samples simultaneously at elevated temperatures. ARCADIS will also designate the two-chamber incubator system as the PCB small chamber test location in E378A for off-gassing of larger materials for this project.

2.2 Project Duration

Expected project start date: September 2009

Expected project completion date: March 2011

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2.3 Project Organization

EPA Work Assignment Manager	Zhishi Guo
ARCADIS Work Assignment Leader	Andy Stinson
Primary ARCADIS Staff	Nancy Roache

2.4 Project Location

This project will be conducted in the following locations

Task	***Location***
Preparation of PCB-containing paint.	H212
Application of PCB-containing paint to a matrix (i.e., a chip).	H212
Extraction of encapsulated PCB-containing paint chips.	H212
Taking wipe samples from the surface of encapsulated PCB-containing paint chips.	H212
PCB off-gassing tests. PCB off-gassing tests will be conducted in small or micro environmental chambers.	H105A / E378A
Determination of PCB migration from sources to settled dust	H105A / E378A
Determination of PCB partitioning between sources and indoor media.	H212
Preparation of PCB standard solutions	H212

3. PROJECT HAZARD ANALYSIS AND CONTROLS

The hazards associated with this project have been assessed using the Hazard Analysis Worksheet located in ***Appendix A***. The source of each hazard has been identified along with the hazard's risk level. The control methods to be used to protect employees and property will be addressed in the following hazard control sections.

3.1 Chemical Hazards

All chemicals used on this project are identified below along with important hazard information. The PPE identified in the table must be used whenever the chemical is handled. Chemical exposure control methods are identified in the Hazard Control section.

Chemical	*Hazards*	*Exposure Limit*	*Symptoms of Overexposure*	*Required PPE*
Aroclor 1016	Irritant Potential carcinogen	1.0 mg/m^3	Irritation to the eyes, nose, throat, skin; headache; depression; dizziness; nausea; vomiting; abdominal pain	Disposable lab coat Safety glasses Butyl/neoprene gloves or Double Nitrile
Aroclor 1260	Irritant Potential carcinogen	0.5 mg/m^3	Irritation and burning of eyes, nose, throat, skin; headache; depression; dizziness; nausea; vomiting; abdominal pain	Disposable coat Safety glasses Butyl/neoprene gloves or Double Nitrile
n-Hexanes	extremely flammable; flash fires possible; fertility hazard	500 ppm	irritation to eyes and nose; light headed; nausea; numbness; weakness; giddiness; dermatitis	Lab coat Safety glasses Nitrile gloves*
Acetone	extremely flammable; flash fires possible; harmful vapors	1000 ppm	irritation to eyes, nose, throat; headache; dizziness; CNS depression; dermatitis	Lab coat Safety glasses Latex gloves*
Methanol	poison; flammable; mutagen; teratogen; absorbs through skin	200 ppm	irritation to eyes, skin, resp. sys.; drowsiness; dizziness; vertigo; nausea; vomiting; distorted vision; dermatitis	Lab coat Safety glasses Nitrile gloves*

Note: An MSDS for each chemical on the list above will be maintained H-212.

3.2 Hazard Control

Hazard control methods for each task are described in this section. Hazards that are present over multiple tasks are described in the All Tasks section.

3.2.1 All Tasks

HAZARD	*CONTROL*	*PPE*
Carcinogen exposure	• All handling of PCB compounds, mixtures, or contaminated material/equipment shall be done using appropriate PPE. • All materials/equipment will be treated as PCB contaminated unless proven otherwise. • CSL 3 requirements will be followed for H212 and other labs as required by SHEM. Only authorized personnel should enter the lab. • Disposable lab equipment and coverings (bench covers, etc) shall be used where feasible. • Work with PCB materials will be conducted in a hood. • All stock PCB (Aroclor) solutions will be maintained in a locked cabinet or refrigerator. Only authorized project personnel will have the key(s). • Mark all containers or equipment containing PCBs greater than 50 ppm with the label shown in Fig.1. If the equipment or container is too small to accommodate Fig. 1 then Fig. 2 may be used.	Safety glasses Disposable lab coat (changed daily) Double Nitrile gloves or neoprene gloves
Dusts	• Utilize well ventilated areas or fume hoods. • Use a dust mask to prevent particle inhalation.	Dust mask
Chemical exposure	• Use good chemical hygiene at all times. • Store chemicals appropriately and only have out the amount that is needed.	See chemical hazard table
Driving	• Use Smith System defensive driving techniques	N/A
UV exposure	• Limit exposure time to UV lamps; turn off lamps before accessing chambers • Use appropriate eye protection	UV radiation glasses

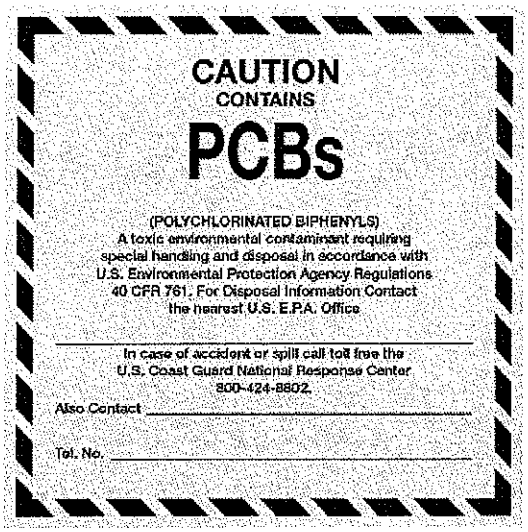

Figure 1

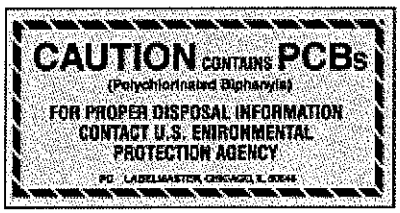

Figure 2

3.3 Hazard Control Procedures

ARCADIS H&S Procedures applicable to this project are listed below. These procedures should be reviewed by the Work Assignment Leader and project personnel. The H&S Department should be contacted with any questions concerning the procedures.

- HSM-018 Chemical Hygiene

4. EMERGENCY PROCEDURES

4.1 Employee Exposure or Injury

In the event that an employee is over-exposed to chemicals or injured, emergency notification to the ARCADIS H&S Department will be made immediately. If symptoms or injuries are life threatening, call for emergency assistance.

Jerry Revis, ARCADIS EHS Officer	**Office: 328-5573 Cell: 616-4168**
Todd Thornton, ARCADIS Asst. Safety Officer	**Office: 328-5617 Cell: 616-4126**
EPA Security	**541-2900**
EPA SHEM Office	**541-2613**
Ambulance	**911**
Carolina Poison Control	**1-800-848-6946**
CHEMTREC	**1-800-424-9300**

If emergency assistance is not needed but professional medical attention is necessary, the employee will be taken to Duke Occupational Health Clinic, Duke Urgent Care, or Duke Medical Center. Arrangements will be made by the H&S Department. Maps to these facilities are located in Appendix B.

4.2 Spill Response

For any non-incidental hazardous chemical spills, employees should immediately contact the APPCD Safety Officer, Richard Valentine, at 541-4437 or the SHEM office, at 541-2613 and the ARCADIS H&S Department. Employees will then follow the ARCADIS Spill Response procedures or applicable Contingency Plans.

Incidental spills may be cleaned up by the employee without notification. Incidental spills are very small spills where the clean up poses no greater exposure risk than what is encountered during the process or operation involving the chemical.

4.2.1 Initial Spill Response

1. Evacuate all non-essential personnel from the area.
2. Identify the spilled material.
3. Determine the size (current and potential) of the spill.
4. Determine if human injury is involved or likely.
5. Determine if the spill is likely to leave the property (e.g. through the sewer system) or make it into the lake.

4.2.2 Small Spill Response

Employees will follow the steps below for small spills of not more than 4L (1 gallon) that do not involve the release of toxic vapors or dusts.

1. Barricade the area with caution tape, signs, or other employees to limit access to the spill area.
2. Extinguish or disconnect all ignition sources for spills involving flammable liquids.
3. Identify hazard information and spill clean-up information from the MSDS
4. Don appropriate PPE.
5. Contain the spill with booms, socks, absorbent, etc.
6. Clean-up the spill.
7. Dispose of the clean-up materials through the hazardous waste system.

4.2.3 Large Spill Response

When a chemical spill presents a threat to human life, is too large to be contained by on-site personnel, or is releasing toxic vapors or dust, the following procedure should be followed:

1. Immediately evacuate the area.
2. Call EPA Security and the SHEM office immediately.
3. Barricade the spill area from a safe distance until responding personnel arrive.
4. Notify the ARCADIS H&S Department as soon as possible.

4.2.4 Specific spill response

Aroclor spills

1. Notify ARCADIS H&S personnel
2. If the spill also involves solvent, remove/extinguish any ignition sources
3. Ventilate the area
4. Don appropriate PPE (safety glasses; lab coat; apron; butyl or neoprene gloves)
5. Absorb spilled material in noncombustible absorbent (such as vermiculite or spill pad)
6. Decontaminate all surfaces that the spill contacted according to the procedure in Appendix C
7. Mark the area where the spill occurred and take wipe samples to ensure decontamination

4.3 Required Emergency Equipment

The following equipment is required to be maintained in good working order through the duration of the project. Immediately contact the ARCADIS H&S Department should any emergency equipment be found faulty. All employees working on this project will be shown the location and proper use of all emergency equipment prior to beginning any work on the project.

X	Emergency Shower/Eyewash		First Aid Kit
	Fire Extinguisher		Cell Phone/Radio
X	Chemical Spill Kit		Other:

5. ENVIRONMENTAL PROCEDURES

5.1 Hazardous Waste

PCB Contaminated Waste (>50 ppm)	Wastes shall be segregated and placed in a container with a Hazardous Waste label and PCB label (Fig. 1). Containers shall be secondarily contained.
PCB Contaminated Waste (<50 ppm)	Wastes shall be segregated and placed in a container with a Hazardous Waste label. Containers shall be secondarily contained.
Solvent waste	Wastes shall be placed in a container with a Hazardous Waste label.

5.2 Air Emissions

Very low levels of PCB may be emitted during the off-gassing of the environmental chambers.

5.3 Waste Water Discharges

None

6. HAZARDOUS MATERIALS TRANSPORTATION

ARCADIS has policies in place for transporting small quantities of hazardous materials and for offering dangerous goods for shipment via ground or air. These policies are designed to maintain the safety of all parties involved in the transportation of the hazardous material. As such, only trained ARCADIS staff may prepare and ship hazardous materials. The ARCADIS H&S Department will be contacted for any and all hazardous material shipments on this project.

6.1 Materials of Trade (MOT)

DOT allows for small amounts of hazardous materials that are used in our work to be transported in company vehicles. This includes things like gasoline, paint, calibration gas, etc. To transport these:

- Project staff must have completed Materials of Trade training.
- Vehicles used in transportation to and from off-site work locations will be in conformance with the ARCADIS vehicle safety policy.
- Only qualifying hazard classes will be transported as MOT.
- Individual hazard class container limits will not be exceeded.
- The total amount of MOT transported in one vehicle will not exceed 440 lbs.
- All MOT will be transported in containers that are leak-proof and secured against breakage

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7. HASP ACKNOWLEDGEMENT

I certify that I have read, understand, and will abide by the safety requirements outlined in this document.

Printed Name	Signature	Date
Andy Stinson		
Nancy Roache		

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Appendix A

Project Hazard Analysis Worksheet

Project Name:	PCBs in Caulk	**Project Number:**	RN990270.0049
Client:	EPA	**WAL:**	Andy Stinson
Assessment Performed By:	Andy Stinson	**Date:**	9/23/2009
Assessment Reviewed By:	Todd Thornton	**Date:**	10/2/2009

Tasks

1 Preparation of PCB-containing paint and Application of PCB-containing paint to a matrix (i.e., paint chip).
2 Extraction of encapsulated PCB-containing paint chips.
3 Taking wipe samples from the surface of encapsulated PCB-containing paint chips
4 PCB off-gassing tests. PCB off-gassing tests will be conducted in small or micro environmental chambers
5 Determination of PCB migration from sources to settled dust & Determination of PCB partitioning between sources and i
6 Preparation of PCB standard solutions

Hazards	Description of Potential Risks	Source(s) or Notes	Task(s)	Frequency	Severity - People	Severity - Property	Risk Rating	FHSH* Page
Physical Hazards								
Driving - General (personal or rental car)	Injury due to motor vehicle accident; propery damage	Transporting of sample from site to the EPA building		2	4	3	MEDIUM	71
Environmental Hazards								
None								
Chemical Hazards								
Carcinogens	Potential cancer causer	Aroclor 1016 and 1260	All	5	5	0	HIGH	
Dusts	Acute and chronic disease from inhalation, absorption, and ingestion of airborne materials	Dust created by paint shaving, Dust possible containing PCB's from collection site	1,2,4 &5	5	4	0	MEDIUM	
Soil, water, sediment contaminants	Various acute and chronic exposure effects depending on contaminant and concentrations	caulk, wallboard, etc...	5	5	4	0	MEDIUM	
Toxins	Injury or illness depending on exposure route, duration, and concentration	PCB's are know toxins	All	5	5	0	HIGH	
Biological Hazards								
None		NA						
Radiological Hazards								
Ultraviolet (UV)	Skin, eye, and other organ damage	Weathering chambers	4	2	2	0	LOW	
Security Hazards								
None								

Training Requirements	Employees
Chemical hygiene	All
Hazard communication	All
Hazardous waste	All
PPE	All

Medical Screening	Employees
Medical Surveillance Exam (HAZWOPER)	All

* FHSH = ARCADIS Field Health & Safety Handbook

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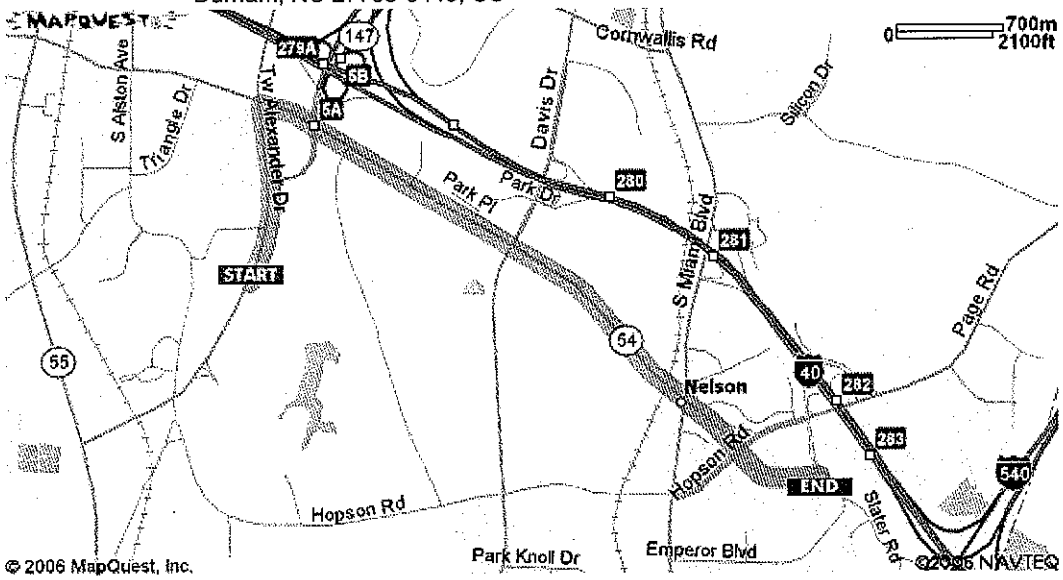
Appendix B

Maps to Emergency Care Facilities

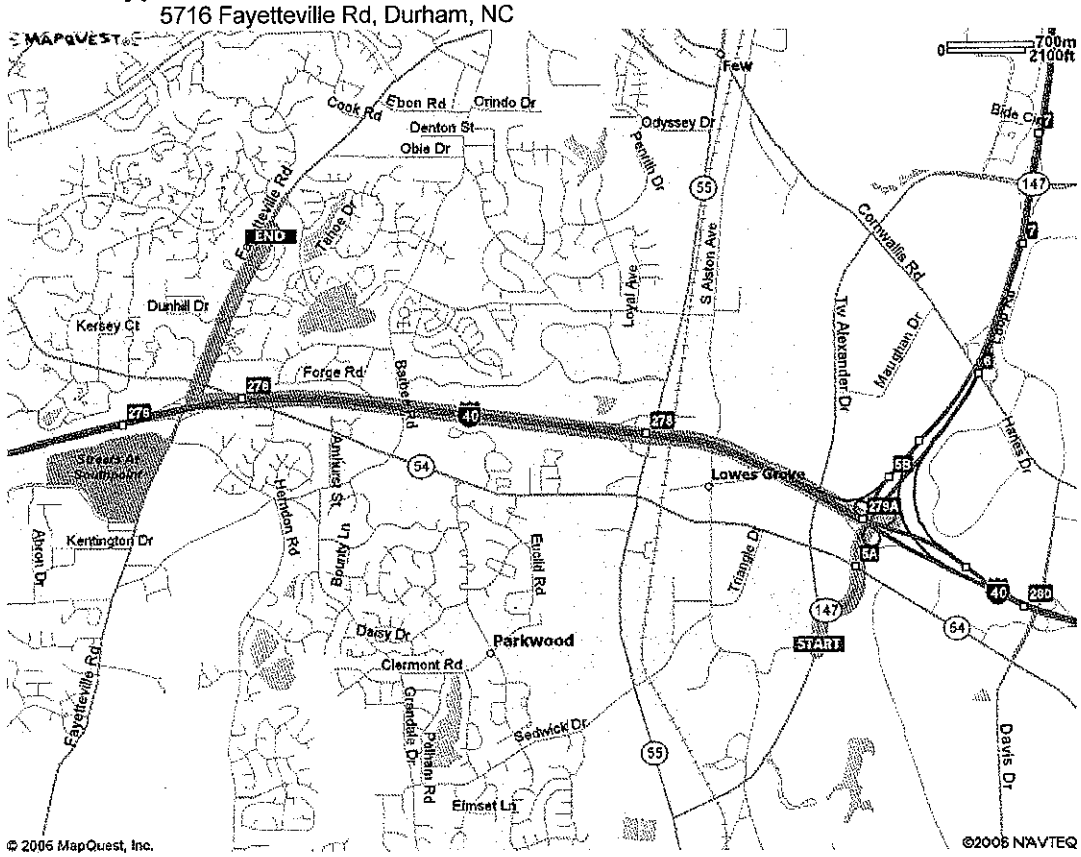
Duke Occupational Health Clinic

Directions	Distance
START 1. Start out going NORTH on TW ALEXANDER DR toward STONESTHROW LN.	0.7 miles
2. Turn RIGHT onto NC-54.	2.0 miles
3. Stay STRAIGHT to go onto SLATER RD (Portions unpaved).	0.6 miles
END 4. End at **1005 Slater Rd** Durham, NC 27703-8448, US	



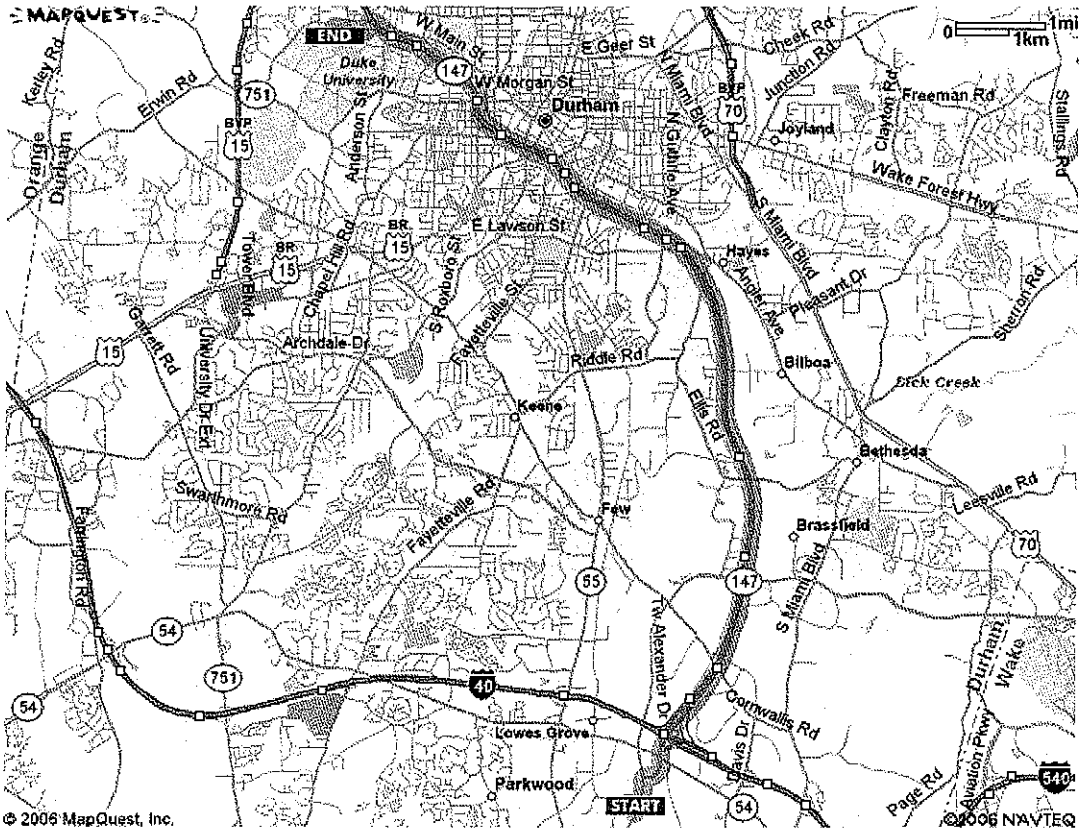
Duke Urgent Care - South

Directions	Distance
1. Start out going NORTH on TW ALEXANDER DR toward NC-147.	0.1 miles
2. Turn RIGHT onto NC-147 N.	0.6 miles
3. Merge onto I-40 W via EXIT 5B toward CHAPEL HILL.	3.4 miles
4. Take the FAYETTEVILLE RD / SOUTHPOINT exit- EXIT 276.	0.2 miles
5. Take the ramp toward DURHAM DOWNTOWN.	< 0.1 miles
6. Merge onto FAYETTEVILLE RD.	0.8 miles
7. End at **Duke Urgent Care South** 5716 Fayetteville Rd, Durham, NC	



Duke Medical Center

Directions		Distance
START	**1.** Start out going NORTHEAST on TW ALEXANDER DR toward STONESTHROW LN.	0.3 miles
NORTH 147	**2.** Turn RIGHT onto NC-147 N.	10.0 miles
15A EXIT	**3.** Take the ELBA ST / TRENT DR exit- EXIT 15A.	0.3 miles
RAMP	**4.** Turn SLIGHT LEFT to take the TRENT DR ramp.	<0.1 miles
	5. Turn SLIGHT LEFT onto TRENT ST.	<0.1 miles
	6. Turn RIGHT onto ERWIN RD.	0.3 miles
END	**7.** End at **Duke University Medical Ctr** Erwin Rd, Durham, NC 27710, US	



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Appendix C

PCB Decontamination Procedure

A. For surfaces that do not appear dusty or grimy before a spill, such as glass, automobile surfaces, newly-poured concrete, and desk tops, use the double wash/rinse procedures in this section.

(a) *First wash.* Cover the entire surface with organic solvent in which PCBs are soluble to at least 5 percent by weight. Contain and collect any runoff solvent for disposal. Scrub rough surfaces with a scrub brush or disposable scrubbing pad and solvent such that each 900 cm^2 (1 square foot) of the surface is always very wet for 1 minute. Wipe smooth surfaces with a solvent-soaked, disposable absorbent pad such that each 900 cm^2 (1 square foot) is wiped for 1 minute. Any surface <1 square foot shall also be wiped for 1 minute. Wipe, mop, and/or sorb the solvent onto absorbent material until no visible traces of the solvent remain.

(b) *First rinse.* Wet the surface with clean rinse solvent such that the entire surface is very wet for 1 minute. Drain and contain the solvent from the surface. Wipe the residual solvent off the drained surface using a clean, disposable absorbent pad until no liquid is visible on the surface.

(c) *Second wash.* Repeat the procedures in paragraph (a) of this section. The rinse solvent from the first rinse (paragraph (b) of this section) may be used.

(d) *Second rinse.* Repeat the procedures in paragraph (b) of this section.

B. Specific requirements for surfaces coated or covered with dust, dirt, grime, grease, or another absorbent material

(a) *First wash.* Cover the entire surface with concentrated or industrial strength detergent or non-ionic surfactant solution. Contain and collect all cleaning solutions for proper disposal. Scrub rough surfaces with a scrub brush or scrubbing pad, adding cleaning solution such that the surface is always very wet, such that each 900 cm^2 (1 square foot) is washed for 1 minute. Wipe smooth surfaces with a cleaning solution-soaked disposable absorbent pad such that each 900 cm^2 (1 square foot) is wiped for 1 minute. Wash any surface <1 square foot for 1 minute. Mop up or absorb the residual cleaner solution and suds with a clean, disposable, absorbent pad until the surface appears dry. This cleaning should remove any residual dirt, dust, grime, or other absorbent materials left on the surface during the first wash.

(b) *First rinse.* Rinse off the wash solution with 1 gallon of clean water per square foot and capture the rinse water. Mop up the wet surface with a clean, disposable, absorbent pad until the surface appears dry.

(c) Follow Procedure A.